

Hypothyroidism-associated angioedema

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ABSTRACT

We present a 41-year-old woman with hypothyroidism who presented to the emergency department with acute onset of angioedema and profound hypothyroidism. She required complex airway management and medical treatment before being discharged home 10 days later. This may be the first case of hypothyroidism-induced angioedema that was not associated with chronic urticaria or hives.

KEYWORDS Angioedema; critical care; hypothyroidism; urticaria

It has been proposed that thyroid autoimmunity, particularly Hashimoto's disease and to a lesser extent Grave's disease, has a strong association in patients with combined urticaria and angioedema.^{1,2} Nearly one-fifth of all patients with chronic urticaria have abnormal thyroid function levels.² No studies to date have shown that abnormal thyroid function is pathogenic with regard to angioedema alone.

CASE REPORT

A 41-year-old woman with hypothyroidism was hospitalized for respiratory distress after developing dyspnea, tongue swelling, and difficulty speaking 1 hour prior to presentation. She denied prior angiotensin-converting enzyme inhibitor use, a family history of angioedema, previous occurrences of tongue swelling, and urticarial or hive symptoms. Home medications included levothyroxine.

Her body mass index was 37 kg/m² with a respiratory rate of 23 breaths/minute, blood pressure of 160/95 mm Hg, and oxygen saturation of 87% on room air with stridor at rest. Severe perioral, tongue, and submandibular edema was noted. No precordial murmurs were heard. The lungs were clear to auscultation. The abdomen was soft, nontender, and with normal bowel sounds. No cyanosis, peripheral edema, rash, urticaria, hives, or lesions were present. Her thyroid-stimulating hormone level was 89.56 µIU/mL (range 0.35–5.0), free T₄, 0.0 ng/dL (range 0.7–1.9), free T₃, <1.0 pg/mL (range 1.71–3.71), C1 esterase inhibitor, 25 mg/dL (range 21–39), and tryptase, 4.6 µg/L (range <10.9).

Within an hour of arrival at the emergency department, her condition rapidly deteriorated with increasing dyspnea and respiratory distress secondary to severe angioedema. Intubation was attempted but was unsuccessful due to laryngeal edema, and the patient subsequently went into pulseless electrical activity. After return of spontaneous circulation with cardiopulmonary resuscitation, emergent cricothyroidotomy was performed. The patient was then taken to the operating room for cricothyroidotomy revision and tracheostomy placement for long-term ventilatory management followed by admission. The patient was sedated, given intramuscular epinephrine and fresh frozen plasma, and placed on high-dose intravenous levothyroxine, methylprednisolone, and diphenhydramine. A chest radiograph showed a right-sided pneumothorax secondary to chest compressions, for which a chest thoracostomy tube was placed.

On day 1, the patient was transitioned to spontaneous ventilation utilizing the tracheostomy tube. On days 2 and 3, she remained on intravenous levothyroxine, methylprednisolone, and diphenhydramine with improvements in tongue and perioral edema. On day 4, she was taken off the ventilator to flow-by oxygen supplementation by way of the tracheostomy tube; her chest thoracostomy tube was removed, and she was transferred to the general medical floor. At that time, she was transitioned to oral prednisone, diphenhydramine, and levothyroxine. On days 5 to 8, her oxygen demands continued to decrease and she was placed on a nasal cannula with continued improvements of perioral swelling. On day 9, her tracheostomy tube was capped and her oxygen

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requirements resolved. She was discharged on day 10 with oral levothyroxine.

DISCUSSION

In this case of hypothyroidism associated with angioedema in a 41-year-old woman with no history of chronic urticaria, the angioedema resolved after 10 days of high-dose corticosteroids, levothyroxine, antihistamines, and fresh frozen plasma treatment. This may be the first case of hypothyroidism-induced angioedema that was not associated with chronic urticaria or hives.

The association between chronic urticaria and autoimmune thyroid dysfunction has long been recognized,^{2–5} as well as the association between angioedema and chronic urticaria.^{1,6} The current literature is, however, limited in determining the true cause of angioedema associated with hypothyroidism. One case-control study in patients with autoimmune thyroid disease and angioedema with chronic urticaria hypothesized that the underlying mechanisms may be associated with autoimmunity⁷; however, this hypothesis has not been tested in experimental studies. The results from that study differ from our case because the patient had no history or current presentation of chronic urticaria or other allergic skin conditions. Upon extensive literature review, no studies or case reports were found that discussed or found associations between hypothyroidism or thyroid autoimmunity and angioedema in patients who do not have concurrent chronic urticaria. This case

highlights that thyroid dysfunction and early testing of thyroid-stimulating hormone level should be considered in patients with an unknown source of angioedema.

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